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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/806,323	07/20/2001	Mel Slater	08364.0007	6776

22852 7590 06/22/2005

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EXAMINER
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GEBRESILASSIE, KIBROM K

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/806,323

Applicant(s)

SLATER, MEL

Examiner

Kibrom K. Gebresilassie

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 03/29/2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 58-113 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 58-113 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. 09806323.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. This action is responsive to the application filed March 29, 2001.
2. Claims 58-113 are examined.

#### ***Priority***

3. The priority date considered for this application is September 29, 1998.

#### ***Oath/Declaration***

4. The office acknowledges receipt of a properly signed oath/declaration filed July 20, 2001.

#### ***Claim Objections***

5. Claims 65-67, 75-77, 92- 94, and 101-103 are objected to because of the following informalities:

- i. As per claims 66, 76, 93, and 102 recite "...the reference plane than are...", which is grammatically incorrect. The examiner assumes "...the reference plane that are...". Appropriate correction is required.
  - ii. As per claims 65, 75, 92, and 101 recite "...with spherical coordinates relative a reference plane", which is grammatically incorrect. The examiner assumes "...with spherical coordinates relative to a reference plane". Appropriate correction is required.
- Claims 67, 77, 94, and 103 are objected because of their dependency.

#### ***Specification***

6. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

7. The disclosure is objected to because of the following informalities: The specification does not include sections in order. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

**Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.

(b) CROSS-REFERENCE TO RELATED APPLICATIONS.

(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR  
DEVELOPMENT.

(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A  
COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer  
program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)),  
and tables having more than 50 pages of text are permitted to be  
submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a).  
"Microfiche Appendices" were accepted by the Office until March 1, 2001.)

(f) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A

"Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

***Claim Rejections - 35 USC § 101***

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 85-113 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. *The Examiner submits that Applicant's have not recited any limitations relating to a practical application in the technological arts and have merely claimed a manipulation of abstract ideas. Section 2106 [R-2] (Patentable Subject Matter - Computer-Related Inventions) of the MPEP recites the following:*

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*"In practical terms, claims define nonstatutory processes if they:*

- consist solely of mathematical operations without some claimed practical application (i.e., executing a "mathematical algorithm"); or*
- **simply manipulate abstract ideas**, e.g., a bid (*Schrader*, 22 F.3d at 293-94, 30 USPQ2d at 1458-59) or a bubble hierarchy (*Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759), **without some claimed practical application.**"*

*In this case, claims 85-113 are simply drawing to the manipulation of abstract ideas as follows:*

*Claims 85, 97, and 106: method of processing, generating and analyzing energy propagation within three-dimensional scene.*

*Claim 111:a signal carrying processor.*

*An invention which is eligible for patenting under 35 U.S.C. § 101 is in the "useful arts" when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result. The fundamental test for patent eligibility is thus to determine whether the claimed invention produces a **"useful, concrete and tangible result."** The test for practical application as applied by the examiner involves the determination of the following factors:*

*(1) "Useful" - The Supreme Court in *Diamond v. Diehr* requires that the examiner look at the claimed invention as a whole and compare any asserted utility with the claimed invention to determine whether the asserted utility is accomplished.*

*(2) "Tangible" - Applying *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994), the examiner will determine whether there is simply a mathematical construct claimed, such as a disembodied data structure and method of making it. If so, the claim involves no more than a manipulation of an abstract idea and therefore, is nonstatutory under 35 U.S.C. § 101. In *Warmerdam* the abstract idea of a data*

*structure became capable of producing a useful result when it was fixed in a tangible medium which enabled its functionality to be realized.*

*(3) "Concrete" - Another consideration is whether the invention produces a "concrete" result. Usually, this question arises when a result cannot be assured. An appropriate rejection under 35 U.S.C. § 101 should be accompanied by a lack of enablement rejection, because the invention cannot operate as intended without undue experimentation.*

*The Examiner respectfully submits, under current PTO practice, that the claimed invention does not recite either a useful, concrete, or tangible result and is merely drawn to a manipulation of abstract ideas.*

- The claims are not **tangible** since, for example, claim 85 appears to be an abstract idea, and fail the tangible test. Because the result of the "energy propagation within three dimensional scene is undefined. Furthermore, claims 86-96, 98-105, and 107- 113 don't appear to resolve the problem.*
- As per claim 111, "A signal carrying processor ..." is non-statutory as not being tangibly embodied in a manner so as to be executable and is non-statutory for failing to be one of the categories of the invention.*
- The claims are not **concrete** because the results are not assured For example, is the outcome possible for any and all energy types?*

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 58-64, 71-74, 81-87, 89- 91, 97-100, 106, and 107 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,313,568 issued to Wallace.

**As per claim 58:**

Wallace discloses computer apparatus for processing data to model energy propagation within a three dimensional scene, comprising;

means for defining a three dimensional environment (col. 1 line 63) for containing a scene to be represented (col. 1 line 3), the environment comprising a plurality of discrete energy propagation (propagation of energy; col. 4 lines 25-26) pathways in a plurality of directions (set of directions; col. 2 line 65) within a three dimensional space (abstract line 6), means for defining objects and energy sources within said three dimensional space (Abstract lines 1-6), means for determining intersections between said pathways (col. 1 lines 63-65) and said objects and energy sources within said three dimensional space, means for determining propagation of energy along pathways (patches; col. 7 lines 1-7) in accordance with said determined intersections(col. 1 lines 64-65), means for defining an energy receiver(element; col. 7 lines 8-13) within said three dimensional space (abstract line 6) for receiving energy propagated along one or more of said pathways (col. 3 lines 62-65) and means for calculating energy received (received the most light; col. 3 line 64) by said energy receiver in accordance with the calculated energy propagation ( col. 3 lines 55-57).

**As per claim 59:**



Wallace discloses apparatus in accordance with claim 58 wherein the energy calculating means is operable to calculate an energy magnitude value (the magnitude; col. 8 line 51) on the basis of energy received (received the most light; col. 3 line 64) by energy receiver (element; col. 7 lines 8-13).

**As per claim 60:**

Wallace discloses viewing plane (col. 2 line 2) and image data (data base; Abstract line 3).

**As per claim 61:**

Wallace discloses angle of incidence ( $\theta_i$ ; Fig. 5).

**As per claim 62:**

Wallace discloses an apparatus in accordance with claim 58 wherein the means for defining a three dimensional environment comprises means for defining a plurality of subsets of pathways (patches; col. 7 lines 1-7; Fig. 1 element H) at different orientation within the three dimensional space, the pathways (patches; col. 7 lines 1-7) of each subset being parallel (Fig. 1 element H).

**As per claim 63:**

Wallace discloses parallel pathways (Fig. 1 element H) arranged in a rectangular array (Fig. 1 element PI).

**As per claim 64:**

Wallace discloses index subsets of pathways in accordance with the direction of the pathways of each subset (Fig. 1 elements R1-R7).

**As per claim 85:**

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A method of processing data to model energy propagation within a three dimensional scene, comprising:

defining a three dimensional environment(col. 1 line 63) for containing pathways (patches; col. 7 lines 1-7) a scene to be represented (abstract lines 5-6);

defining a plurality of discrete energy propagation (propagation of energy; col. 4 lines 25-26) pathways in a plurality of directions(set of directions; col. 2 line 65) in said environment (col. 1 line 63);

defining objects and energy sources within said source (abstract lines 8-9);

determining intersections between said pathways and said objects and light sources (col. 2 lines 7-9);

determining data defining the propagation of energy (abstract lines 3-4) between pathways in accordance with said intersection (co. 1 lines 64-65);

receiving energy propagation information at a position in said scene for one or more of said pathways (col. 1 lines 67-68 col. 2 lines 1-2); and

calculating energy received in said receiving step in accordance with energy propagation data along a selected subset of said pathways (co. 4 lines 7-11).

**As per claims 71, 81, and 106:**

The limitations of claims 71, 81, 85, 97, and 106 have already been discussed in the rejection of claim 58. They are therefore rejected under the same rationale.

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**As per claims 72, 89, and 98:**

The limitations of claims 72, 89, and 98 have already been discussed in the rejection of claim 62. They are therefore rejected under the same rationale.

**As per claims 73, 90, and 99:**

The limitations of claims 73, 90, and 99 have already been discussed in the rejection of claim 63. They are therefore rejected under the same rationale.

**As per claims 74, 91, and 100:**

The limitations of claims 74, 91, and 100 have already been discussed in the rejection of claim 64. They are therefore rejected under the same rationale.

**As per claims 82, 86, and 107:**

The limitations of claims 82, 86, and 107 have already been discussed in the rejection of claim 59. They are therefore rejected under the same rationale.

**As per claims 83, 87, and 108:**

The limitations of claims 83, 87, and 108 have already been discussed in the rejection of claim 60. They are therefore rejected under the same rationale.

**As per claims 84, 88 and 109:**

The limitations of claims 84, 88 and 109 have already been discussed in the rejection of claim 61. They are therefore rejected under the same rationale.

**As per claim 97:**

The limitations of claim 97 have already been discussed in the rejection of claim 85. It is therefore rejected under the same rationale.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 65-70, 75-80, 88, 92-96, and 101-105, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,313,568 issued to Wallace as applied to the rejection of claims 58-64, 71-74, 81-87, 89-91, 97-100, 106, and 107 above in view of European Application No. 95938509.7 (International Application No. PCT/GB95/02798) issued to Wrigley.

**As per claim 65:**

Wallace fails to disclose spherical coordinates relative to a reference plane. However, Wrigley discloses spherical coordinates (spherical bounding envelope, the coordinates... page 6 lines 3-4; Fig. 5). It would have been obvious to one of ordinary skill in the art to modify the apparatus of Wallace as taught by Wrigley. The motivation for doing so would have been more convenient to determine all the intersections of each pathway with the bounding volumes.

**As per claim 66:**

Wallace discloses apparatus in accordance with claim 65 wherein the means for defining an environment is operable to define an environment which comprises a larger number of pathways in directions at smaller angles to the reference plane (surface A; col. 4 line 43; Fig. 1 element A) that are defined in direction at larger angles to the

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reference plane, such that the distribution of pathway directions within the field is substantially uniform (Fig. 3).

**As per claim 67:**

Wallace discloses apparatus in accordance with claim 66 wherein the means for defining an environment is operable to define pathways such that the number of pathways defined in directions at a particular angle to the reference plane is substantially proportional to the complement of said particular angle (Fig. 9A (left side drawing)).

**As per claim 68:**

Wrigley discloses apparatus with accordance with claim 58 wherein the means for determining intersections is operable to store information, in respect of an intersection, relating to the identity of the pathway and the object with which it intersects (page 6 lines 44-45).

**As per claim 69:**

Wallace discloses an apparatus in accordance with claim 68 wherein the means for determining intersections is operable to store information, in respect of an intersection, defining energy propagation at that intersection (col. 1 lines 63-65).

**As per claim 70:**

Wrigley discloses apparatus in accordance with claim 58 wherein the energy propagation determining means is operable to process energy propagation information for a pathway with an intersection with an object (page 2 lines 38-40), to identify one or more pathways on to which energy is to be propagated from said intersecting pathway

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(page 2 lines 44-45), and to generate energy propagation information for said identified pathway or pathways (page 2 lines 52-54).

**As per claims 75, 92, and 101:**

The limitations of claims 75, 92, and 101 have already been discussed in the rejection of claim 65. They are therefore rejected under the same rationale.

**As per claims 76, 93, and 102:**

The limitations of claims 76, 93, and 102 have already been discussed in the rejection of claim 66. They are therefore rejected under the same rationale.

**As per claims 77, 94, and 103:**

The limitations of claims 77, 94, and 103 have already been discussed in the rejection of claim 67. They are therefore rejected under the same rationale.

**As per claims 78, 95, and 104:**

The limitations of claims 78, 95, and 104 have already been discussed in the rejection of claim 68. They are therefore rejected under the same rationale.

**As per claim 79:**

The limitation of claim 79 has already been discussed in the rejection of claim 69. It is therefore rejected under the same rationale.

**As per claims 80, 96, and 105:**

The limitations of claims 80, 96, and 105 have already been discussed in the rejection of claim 70. They are therefore rejected under the same rationale.

**As per claim 112:**

Wrigley discloses a method in accordance with at least one of the claims 88, 108 or 109, including the steps of generating a signal conveying image data (image data; page 7 line 49) generated by said image data generating step and recording the signal either directly or indirectly (page 6 lines 25-30).

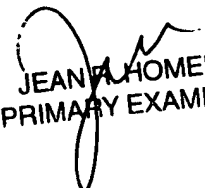
**As per claim 113:**

The limitation of claim 113 has already been discusses in the rejection of claims 1 and 112. It is therefore rejected under the same rationale.

***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

13. Any inquiring concerning this communication or earlier communication from the examiner should be directed to Kibrom K. Gebresilassie whose telephone number is (571) 272-8571. The examiner can normally be reached on Monday-Friday, 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner supervisor, Jean R. Homere can be reached at (571) 272-3780. The official fax number:(703) 872-9306. Any inquiring of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is: (571) 272-3700.

  
JEAN R. HOMERE  
PRIMARY EXAMINER